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FDI, Local Sourcing, and Supportive Linkages with Domestic Suppliers: The Case of Monterrey, Mexico

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Summary. — In this paper, we use unique data from firm level surveys among foreign-owned and domestic producer firms as well as domestic suppliers to obtain novel direct empirical evidence on the level, supportive nature, and impact of input–output linkages in Monterrey, Mexico. Our main empirical findings are threefold. First, FDI firms and Mexican firms do not differ in their level of use of local suppliers of material inputs and production services. Second, we find evidence of a variety of types of support that producer firms transmit to their local suppliers. Importantly, FDI firms are significantly more supportive than Mexican firms. This applies in particular to types of support that are linked closely to improving the production processes of suppliers. We also find that several other producer firm characteristics are associated with the use of local suppliers or the provision of support. Third, we find significant differences between maquiladora firms of different generations regarding the scale and nature of their impact among local suppliers.

Key words — FDI, maquiladora, input–output linkages, spillovers, multivariate analysis, Monterrey, Mexico, Latin America

1. INTRODUCTION

The last two decades have witnessed a rapid growth of the research field engaged with the statistical identification and quantification of spillovers from foreign direct investment (FDI) in host economies (Blomström & Kokko, 1998; Crespo & Fontoura, 2007; Lipsey, 2004). Domestic firms may benefit from the presence and operations of FDI firms, as demonstration effects, labor turnover, and input–output linkages may facilitate flows of technology and skills to these domestic firms. Having said this, the empirical evidence is also characterized by a considerable degree of heterogeneity, reflecting the complexity that surrounds the satisfactory identification of FDI spillovers (Blomström & Kokko, 2003; Jordaan, 2009).

Furthermore, econometric studies on FDI externalities face limitations when it comes to addressing important questions on why and how FDI spillovers are generated and transmitted. The closest to identifying channels of FDI spillovers come studies that estimate the relation between the level of industry foreign participation and productivity of domestic firms in input-supplying industries (e.g., Blalock & Gertler, 2008; Kugler, 2006). However, findings of a positive association between industry foreign participation and productivity in related industries only constitute indirect evidence that input–output linkages are the main channel via which technologies are shared and transmitted. This indicates that there is a need to obtain further detailed evidence on the scale and nature of input–output linkages that FDI firms establish. This is especially the case for developing countries, for which evidence on the operations and effects of FDI firms tends to be far more limited. This lack of evidence, combined with the fact that many developing country governments see the attraction of FDI firms as a very important element of their economic development strategies, indicates the importance of obtaining more detailed evidence on the existence and effects of FDI backward linkages in developing country settings (Ivarsson & Alvstam, 2005a, 2005b; Moran, 2005).

The purpose of this article is to conduct a detailed empirical study on the level and nature of input–output linkages between foreign-owned manufacturing firms and domestic suppliers in a developing host country setting. Using unique data from several firm level surveys that we applied in key manufacturing industries in the metropolitan area of Monterrey, Mexico, we analyze the scale and supportive nature of FDI backward linkages, in the context of these linkages potentially representing an important transmission channel of new knowledge and technologies. Furthermore, we conduct multivariate analysis to identify statistically firm level characteristics that affect both the level of use of local suppliers and the degree to which sourcing linkages are supportive in nature.

The main contribution of our analysis is threefold. First, the vast majority of previous research has focused exclusively on backward linkages between FDI firms and domestic suppliers. The common assumption is that FDI firms are less integrated locally than domestic producer firms, but this assumption is normally not tested. Our careful research design allows us to ascertain statistically whether and how FDI firms actually differ from comparable domestic producer firms regarding the level of use of local suppliers and the provision of support. Furthermore, our evidence is also novel as it contains representative information on the pool of local suppliers in the region that further clarifies whether there are differences in the dynamic impact between the two types of producer firm. Second, we conduct multivariate analysis to identify statistically the effects of a variety of firm level characteristics on the level of use of local suppliers and the provision of support. Next to obtaining important new evidence on which firm characteristics may influence the use of local suppliers and the nature of local linkages, this analysis also tests in a multivariate setting whether and how FDI and domestic producer firms differ in the impacts that they generate. Finally, we are able to link our analysis into the important debate on the role of younger generation maquiladora firms in future processes of economic development in the north of Mexico. Following the opening up of the Mexican economy in the late 1980s, there has been a large increase in the scale of economic activity in Mexico's northern states. At the same time, recent research is suggesting that there is a growing presence of second and third generation

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maquiladora firms, which focus more on producing products compared to traditional assembly-style first generation maquiladoras. In combination, these processes may be creating a situation where younger generation maquiladora firms are starting to generate a larger positive impact on their local economy. Our analysis contributes to this debate by providing novel statistical evidence on whether maquiladora firms of different generations differ in the local impact that they generate.

The article is constructed as follows. In Section 2 we discuss in more detail the concept of FDI backward linkages and why these linkages are related to the occurrence of externalities. This section also looks at previous research on FDI linkages in Mexico. From this, we develop our research questions. Section 3 explains the research design of our fieldwork, presents findings from dichotomous comparisons between FDI and Mexican producer firms, and presents indications of the overall impact of the sourcing linkages of these two types of firm. Section 4 presents our multivariate analysis of the effects of firm level characteristics on the level of local sourcing and the provision of support. The main findings of this section can be summarized as follows. First, after controlling for a range of firm level characteristics, type of ownership is not significantly associated with the level of use of local suppliers. Second, type of ownership does matter when it concerns the provision of support: FDI firms are significantly more supportive compared to their Mexican owned counterparts, suggesting that FDI firms are a better source of positive externalities. Third, our findings indicate that younger generation maquiladora firms use more local suppliers and also offer more support compared to first generation maquiladora firms, suggesting that there are important differences in the economic impact between maquiladora firms of different generations. Finally, Section 5 summarizes and discusses policy implications.

2. FDI AND BACKWARD LINKAGES WITH LOCAL SUPPLIERS

(a) *Impacts of FDI via local sourcing*

Applied economics research on FDI linkages usually distinguishes between direct and indirect effects (Dunning, 1993; Scott-Kennel & Enderwick, 2005) or static and dynamic impacts (Potter, Moore, & Spires, 2002). The static impact relates to the level of use of suppliers by an FDI firm, generating economic multiplier effects in the host economy. Dunning (1993) reviews several studies on the static impact of FDI in developing countries and concludes that the degree of use of local suppliers can differ substantially between countries. The perception is that domestic firms use suppliers to a higher degree than FDI firms (UNCTAD, 2001), although this is usually not tested empirically.

Next to trying to obtain indicators of the static impact, related research is engaged with identifying FDI characteristics that may influence the direct effects. A good example of this is Belderbos, Capannelli, and Fukao (2001), who conduct multivariate analysis to explain the level of use of suppliers by a sample of Japanese FDI firms in a large number of host economies. They find that firms that produce for international markets use less domestic suppliers compared to firms producing for host economy markets. Another factor that may be important is the age of an FDI firm, as it takes time to identify suitable suppliers (Driffield and Noor, 2000; Giroud & Hafiz Mirza, 2006; Kiyota, Toshiyuki, Urata, & Yuhong, 2008). Also, it takes time for FDI firms to become embedded into their local economy, depending on the degree to which personal relationships are important to create sustainable linkages with domestic firms (Francis, Muhkerji, & Mukheri, 2009). The role of an FDI firm in the multinational enterprise (MNE) to which it belongs can also be important, as affiliates do not always have control over sourcing decisions (Jindra, Giroud, & Scott-Kennel, 2009; Zanfei, 2000). Other factors that may be important include the size of the FDI firm, its mode of establishment, and the type and nature of its production processes (UNCTAD, 2001).

Recently, more emphasis is placed on the indirect or dynamic impact from FDI backward linkages. This impact relates to the notion that backward linkages are a good conduit for knowledge flows between FDI firms and their suppliers (UNCTAD, 2001). Input–output linkages usually involve frequent contacts between buying and supplying parties, resulting in exchanges of information, knowledge, and skills (Giroud & Scott-Kennel, 2009). Furthermore, FDI firms in developing countries in particular usually have an active interest in improving their local suppliers, which may result in a variety of types of support that foreign-owned firms provide their suppliers with.[1] Lall (1980) presents a classic case study with detailed information on a variety of types of support provided by a foreign-owned truck manufacturer in India, including assistance with the creation of new suppliers, technological upgrading of suppliers' production processes, and assistance with sourcing. Potter *et al.* (2002) also find in their survey among manufacturing firms in the UK that FDI firms provide a variety of support, whereby assistance with production, quality testing, and the provision of training programs are the most common types. Smarzynska and Spatareanu (2005) present further corroborating evidence of supportive linkages for FDI in the Czech Republic and Latvia (see also Javorcik, 2008). Related evidence on supportive FDI firms for several other developing countries is presented in UNCTAD (2001).

(b) *FDI and input–output linkages in the Mexican economy*

Following the introduction of economic liberalization and trade promotion in the late 1980s, FDI flows into Mexico have surged (Jordaan, 2008a, 2009; Pacheco-Lopez, 2005; Ramirez, 2003). Of course, an important factor explaining the increasing levels of inward FDI has been the creation of the North American Free Trade Agreement (NAFTA) in 1994 (Blomström & Kokko, 1997; Cuevas, Messmacher, & Werner, 2005). In line with the growing presence of FDI activity, there has been increasing interest in FDI spillovers in Mexican manufacturing industries (e.g., Aitken, Hanson, & Harrison, 1997; Blomström, Kokko, & Zejan, 2000; Blomström & Wolff, 1994). The most recent empirical findings are based on unpublished census data from 1994 and indicate the presence of significant FDI externalities (Jordaan, 2005, 2008b, 2010). Regarding technology transfers via FDI backward linkages, findings presented by Jordaan (2008c) are particularly important, as they identify a positive association between industry foreign presence and productivity of Mexican firms in input-supplying industries.

Next to these quantitative findings, there has been substantial interest from survey- and case-study-based research in FDI sourcing practices. The majority of these studies have focused on obtaining indicators of the static impact of FDI firms. For instance, findings from a survey in 1990 among 63 of the largest FDI firms in Mexico indicate that one out of three firms sourced more than 25% of their inputs from Mexican suppliers (UNCTC, 1992). Another more recent survey of similar size among FDI firms with EU parents reports a